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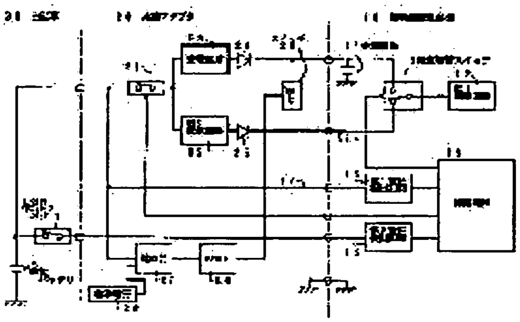
(54) POWER SUPPLY SYSTEM FOR PORTABLE ON-VEHICLE RADIO TELEPHONE SET

(57)Abstract:

PURPOSE: To prevent the malfunction and the interruption of speech in a radio telephone set even when short-time reduction in the supply voltage occurs in an on-vehicle battery in the case of mounting the portable radio telephone set on the vehicle.

CONSTITUTION: If the voltage of an on-vehicle battery B is reduced when a portable radio telephone set 10 is connected to an on-vehicle adapter 20, a switch 26 is immediately turned on by the detection signal from a comparing means 27 which compares the voltage with a reference voltage 29, and a power supply circuit 12 of the portable radio telephone set 10 is connected to a charging battery 11, and the portable radio telephone set is driven by the voltage of this charging battery 11. Thus, the normal operation of the portable radio telephone set is secured and the interruption of speech is avoided even if the voltage of the on-vehicle battery B is reduced.



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CLAIMS

[Claim(s)]
[Claim 1] The portable wireless telephone which built in the charge cell and the power circuit and was constituted removable to vehicles The function to connect with the mounted battery with which separates the aforementioned power circuit from a charge cell, and vehicles are equipped when vehicles are equipped with this portable wireless telephone, and to charge the aforementioned charge cell by the charging circuit The switch which is the current supply method of the mounted type portable wireless telephone equipped with the above, and short-circuits the aforementioned charging circuit and the aforementioned power circuit, It has a comparison means [supply voltage / from the aforementioned mounted battery / reference voltage]. When it is detected by this comparison means that the supply voltage from a mounted battery is lower than reference voltage, the aforementioned switch is turned on during fixed time and it is characterized by constituting so that the power of the charge cell connected to the aforementioned charging circuit may be supplied to a power circuit.
[Claim 2] The current supply method of the mounted type portable wireless telephone of the claim 1 which prepared the aforementioned switch and the comparison means in the mounted adapter.
[Claim 3] The current supply method of the mounted type portable wireless telephone of the claim 1 which prepared the aforementioned switch and the comparison means in the portable wireless telephone.
[Claim 4] It is the current supply method of the mounted type portable wireless telephone of claims 2 or 3 which a portable wireless telephone has the switching means changed by the 2nd power circuit of **** when preparing a power circuit in a charge cell and a mounted adapter, and connects and becomes so that the aforementioned switch may short-circuit these switching means.
[Claim 5] The current supply method of the mounted type portable wireless telephone of a claim 4 which comes to connect adverse current prevention diode between a switching circuit, the charging circuit of a mounted adapter, and the 2nd power circuit.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] Especially this invention relates to the current supply method which made it possible to supply the supply voltage stabilized when the supply voltage from a mounted battery carried out a change fall greatly momentarily about the current supply method of mounted type portable wireless telephones, such as a handheld computer portable car telephone.
[0002]
[Description of the Prior Art] It is mounted types, such as a handheld computer portable car telephone, and the car telephone equipment of an attachment-and-detachment formula consists of a mounted antenna, a portable wireless telephone, and a mounted adapter, and a portable wireless telephone is equipped with an antenna, a walkie-talkie, a charge cell, etc. This portable wireless telephone is made into a mounted state by usual, and a required power supply is supplied from the battery (a mounted battery is called below) of an automobile. Moreover, when removing and using it from a mounted adapter, the built-in charge cell serves as a power supply, and charge to this charge cell is performed by the supply voltage of a mounted battery when a portable wireless telephone is connected with a mounted adapter.
[0003] Drawing 3 is the block diagram showing an example of the composition of the charging circuit to this kind of the conventional current supply circuit and conventional charge cell in car telephone equipment. As for a portable wireless telephone and 20, in this drawing, 10 is [the power circuit system of a mounted adapter and 30] a part of electrical power systems of an automobile, B shows the mounted battery and especially IGN shows the ignition switch.
[0004] In the power control system of the aforementioned portable wireless telephone 10 11 Moreover, a charge cell with a built-in portable wireless telephone, The 1st power circuit by which 12 supplies supply voltage to each part of a portable telephone, the power supply circuit changing switch with which 13 changes connection between either of the current supply lines 14 from the charge cell 11 and a mounted adapter, and the 1st power circuit 11, The 1st voltage detector which judges whether 15 detects the voltage of the power supply line 17, and the portable wireless telephone is connected to the mounted adapter 20, 16 detects the voltage of the power supply line of ignition. ON of the ignition switch IGN, The 2nd voltage detector which judges OFF, and 18 show the control circuit which controls the battery electric power switch 21 prepared in the power supply circuit changing switch 13 and the mounted adapter 20 with the signal from each the 1st and 2nd voltage detectors 15 and 16.
[0005] Moreover, in the power circuit system 20 of a mounted adapter, the battery electric power switch which changes ON/OFF of the current supply to the charging circuit 23 and the 2nd power circuit 22 which mention 21 later from the mounted battery B, the 2nd power circuit to which 22 supplies the supply voltage from a mounted battery as supply voltage of a portable wireless telephone, and 23 show the charging circuit which supplies the power of a mounted battery to the charge cell 11.
[0006] In this current supply method, if the portable wireless telephone 10 is connected to the mounted adapter 20, it will be detected that the portable wireless telephone 10 was connected to the mounted adapter 20 by the 1st voltage detector 15. Moreover, if the ignition switch IGN is turned ON, it will be detected that the ignition switch was switched on by the 2nd voltage detector 16. By these detecting signals, a control circuit 18 changes the battery electric power switch 21 to ON, and

changes the power supply circuit changing switch 13 to the current supply line 14 side. The power of the mounted battery B is supplied to the 1st power circuit 12 from the 2nd power circuit 22, and a portable wireless telephone 10 is supplied further, and the charge cell 11 is supplied through a charging circuit 23, and, thereby, charge of the charge cell 11 is performed.

[0007] On the other hand, since the connectionless state is detected by the 1st voltage detector 15 when the portable wireless telephone 10 is not connected to the mounted adapter 20, a control circuit 18 turns off the battery electric power switch 21, and changes the power supply circuit changing switch 13 to the charge cell 11, and the power of the charge cell 11 is supplied to the 1st power circuit 12, and it is supplied to a portable wireless telephone 10. In addition, the thing of a publication is in JP,3-40637,A and JP,56-138343,A as technology near this kind of current supply method.

[0008]

[Problem(s) to be Solved by the Invention] The supply voltage which the electromotive voltage of a mounted battery will fall momentarily by this if the load of large power arises to the mounted battery B like at the time of the time of an engine start or headlight lighting when connecting a portable wireless telephone to a mounted adapter by the current supply method of a conventional such mount portable wireless telephone and having received supply of a mounted battery to power, and is supplied to a portable wireless telephone is large, a change fall is carried out, operating [of a portable wireless telephone] becomes unstable, and it is generated in a malfunction. Moreover, in being remarkable, there is a possibility that a talk state may serve as **.

[0009] Generally, since the information for maintaining talk states, such as a specification channel and transmitting power level, is always held, even when it becomes impossible to maintain a talk state by the fall of momentary supply voltage, it consists of portable wireless telephones so that it can return to a talk state again based on the information in front of the talk state currently held. However, since predetermined time was needed for return operation based on the information in front of a talk state in this case, it is difficult to avoid a malfunction in the meantime, and it became difficult to avoid ****** of a short time by the fall of supply voltage.

[0010]

[Objects of the Invention] The purpose of this invention is to offer the current supply method of the mounted type portable wireless telephone which prevented the malfunction in a radiotelephone, even when the fall of short-time supply voltage arises. Moreover, other purposes of this invention are to offer the current supply method of the mounted type portable wireless telephone which made it possible to prevent beforehand ****** when the fall of short-time supply voltage arises.

[0011]

[Means for Solving the Problem] The portable wireless telephone which the current supply method of this invention built in the charge cell and the power circuit, and was constituted removable to vehicles, When vehicles are equipped with this portable wireless telephone, it connects with the mounted battery with which separates the aforementioned power circuit from a charge cell, and vehicles are equipped. And the switch which consists of mounted adapters which have the function to charge the aforementioned charge cell by the charging circuit, and short-circuits the aforementioned charging circuit and the aforementioned power circuit, It has a comparison means [supply voltage / from the aforementioned mounted battery / reference voltage]. When it is detected by this comparison means that the supply voltage from a mounted battery is lower than reference voltage, the aforementioned switch is turned on during fixed time and it is characterized by constituting so that the power of the charge cell connected to the aforementioned charging circuit may be supplied to a power circuit.

[0012] Here, a switch and a comparison means are prepared in a mounted adapter, or are prepared in a portable wireless telephone. Moreover, adverse current prevention diode is connected between a switch, the charging circuit of a mounted adapter, and the 2nd power circuit.

[0013]

[Function] When having connected the portable wireless telephone to a mounted adapter and the voltage of a mounted battery falls, a switch turns on immediately by the detecting signal from a comparison means, the power circuit of a portable wireless telephone is connected to a charge cell, and a portable wireless telephone is made to drive with the power of this charge cell. For this reason, irrespective of the fall of the voltage of a mounted battery, normal operation of a portable wireless

telephone is secured, and ****** is avoided.
[0014]
[Example] Next, the example of this invention is explained with reference to a drawing. Drawing 1 is the block diagram of the 1st example of this invention. As for a portable wireless telephone and 20, in this drawing, 10 is [a mounted adapter and 30] a part of electrical power systems of an automobile. In addition, in the electrical power system 30 of an automobile, B is a mounted battery and IGN is an ignition switch.

[0015] In the power control system of the aforementioned portable wireless telephone 10 11 The charge cell of built-in in a portable wireless telephone 10, The 1st power circuit by which 12 supplies supply voltage to each part of a portable wireless telephone 10, The power supply circuit changing switch with which 13 changes connection between either of the current supply lines 14 from the charge cell 11 or a mounted adapter, and the 1st power circuit 12 of the above, The 1st power supply detector which judges whether 15 detects the voltage of the power supply line 17, and the portable wireless telephone 10 is connected to the mounted adapter 20, The 2nd voltage detector with which 16 detects the voltage of the power supply line of ignition, and the ignition switch IGN judges [ON or] it to be whether it is off, 18 -- the [the above 1st and] -- the control circuit which controls the battery electric power switch 21 prepared in the power supply circuit changing switch 13 and the aforementioned mounted adapter 20 with the signal from 2 voltage detectors 15 and 16 is shown In addition, the power control system of this portable wireless telephone 10 is considered as the same composition as an old thing.

[0016] Moreover, the battery electric power switch which changes ON/OFF of the current supply to the charging circuit 23 and the 2nd power circuit 22 which mention 21 later from the mounted battery B in the power circuit system 20 of a mounted adapter, The 2nd power circuit to which 22 supplies the supply voltage from a mounted battery as supply voltage of a portable wireless telephone, The charging circuit by which 23 supplies the supply voltage from a mounted battery to the charge cell 11, 24, the diode for adverse current prevention which connected 25 to each output side of the aforementioned charging circuit 23 and the 2nd power circuit 22, The switch which connects 26 between the outputs of the diodes 24 and 25 for these adverse current prevention, and connects the current supply line 14 from a mounted adapter with the charge cell 11 too hastily, The monostable multivibrator to which the voltage comparator with which 27 compares the supply voltage and reference voltage 29 from the mounted battery B, and 28 hold a fixed time output when the output of the voltage comparator 27 changes, and 29 show reference voltage.

[0017] Next, operation of this example is explained. if a portable wireless telephone 10 is connected to the mounted adapter 20 and the ignition switch IGN is switched on, the 1st voltage detector 15 and the 2nd voltage detector 16 will detect this state -- having -- the [these 1st voltage detector 15 and] -- a control circuit 18 turns on the battery electric power switch 21 with the signal from 2 voltage detector 16, and the power supply circuit changing switch 13 is changed to the current supply line 14 side Therefore, the power of the mounted battery B is supplied to the 2nd power circuit 22, is supplied to the 1st power circuit 12 through the adverse current prevention diode 25, and is further supplied to a portable wireless telephone. Moreover, the power of the mounted battery B is supplied to a charging circuit 23, the charge cell 11 is supplied through the adverse current prevention diode 24, and, thereby, charge of the charge cell 11 is performed.

[0018] And if the supply voltage from the mounted battery B falls from the reference voltage 29 between instants by operation of an engine start, headlight lighting, etc. when having received supply of power from the mounted battery B through this mounted adapter 20, the voltage comparator 27 will detect this state immediately based on comparison on voltage with reference voltage 29, and will send a detecting signal to a monostable multivibrator 28. A monostable multivibrator 28 makes the switch 26 between fixed time turn on in response to this detecting signal. By this, the charge cell 11 will be connected to the 1st power circuit 12 through a switch 26 and a circuit changing switch 13, and the power from the charge cell 11 will be supplied to a portable wireless telephone as a result.

[0019] Since the voltage of the mounted battery B has also returned at this time after operation of fixed time by this monostable multivibrator 28 is completed, a switch 26 becomes off, it will return to the state till then, and a portable wireless telephone 10 will operate in response to supply of the power from the mounted battery B. In addition, although a charging circuit 23 and the 2nd power circuit 22 are made into the state where it connected with the 1st power circuit 12 too hastily, by turning on a switch 26, since the adverse current prevention diodes 24 and 25 are connected to each, the fault on a circuit does not arise.

[0020] therefore, since the supply voltage of the charge cell 11 by which the switch 26 was turned on by operation of the voltage comparator 27 and a monostable multivibrator 28 in an instant, and was contained in the portable wireless telephone 10 by it is supplied to a portable wireless telephone 10 even if the supply voltage from the mounted battery B falls momentarily by consumption of the large power at the time of an engine start and headlight lighting etc., the supply voltage of a portable wireless telephone 10 not falling, and preventing malfunction and ****** cuts

[0021] In addition, since the connectionless state is detected by the 1st voltage detector 15 when the portable wireless telephone 10 is not connected to the mounted adapter 20, a control circuit 18 turns off the battery electric power switch 21, and changes the power supply circuit changing switch 13 to the charge cell 11, and the power of the charge cell 11 is supplied to the 1st power circuit 12, and it is supplied to a portable wireless telephone. By this, as for a portable wireless telephone, power will be supplied by the charge cell 11.

[0022] Drawing 2 is the block diagram of the 2nd example of this invention. In this example, the same sign is given to the portion equivalent to the 1st example. That is, as for a portable wireless and 20, 10 is [a mounted adapter and 30] a part of electrical power systems of an automobile. Moreover, B is a mounted battery and IGN is an ignition switch.

[0023] In this example, while equipping the power control system 10 of a portable wireless telephone with the charge cell 11, the 1st power circuit 12, the power supply circuit changing switch 13, the 1st power supply detector 15, the 2nd voltage detector 16, and a control circuit 18, it has the adverse current prevention diodes 24 and 25 which prepare up in the mounted adapter 20 in the aforementioned example, and were, the switch 26, the voltage comparator 27, the monostable multivibrator 28, and the reference supply 29. Moreover, the power circuit system of the mounted adapter 20 is equipped with the battery electric power switch 21, the 2nd power circuit 22, and the charging circuit 23.

[0024] Also in this 2nd example, if a portable wireless telephone 10 is connected with the mounted adapter 20 and the ignition switch IGN is switched on, the power of the mounted battery B will be supplied to the 2nd power circuit 22, will be supplied to the 1st power circuit 12 through the adverse current prevention diode 25, and will be further supplied to a portable wireless telephone 10. Moreover, it is the same that the power of the mounted battery B is supplied to a charging circuit 23, the charge cell 11 is supplied through the adverse current prevention diode 24, and charge of the charge cell 11 is performed by this.

[0025] And when the supply voltage from the mounted battery B falls from the reference voltage 29 between instants by operation of an engine start, headlight lighting, etc. in this case, based on comparison, the voltage comparator 27 detects this state on voltage with reference voltage 29 immediately, operates a monostable multivibrator 28 on it, and makes it turn on the switch 26 between fixed time. It is the same that the charge cell 11 will be connected to the 1st power circuit 12 through a switch 26 and the power supply circuit changing switch 13, and the power from the charge cell 11 will be supplied to a portable wireless telephone 10 as a result by this.

[0026] therefore, since the supply voltage of the charge cell 11 by which the switch 26 was turned on by operation of the voltage comparator 27 and a monostable multivibrator 28 in an instant, and was contained in the portable wireless telephone 10 by it is supplied to a portable wireless telephone even if the supply voltage from the mounted battery B falls momentarily by consumption of the large power at the time of an engine start and headlight lighting etc., the supply voltage of a portable wireless telephone 10 not falling, and preventing malfunction and ****** cuts

[0027]

[Effect of the Invention] As explained above, if the voltage of a mounted battery falls when this invention has connected the portable wireless telephone to a mounted adapter, since a switching circuit turns on immediately, and connects with the charge cell which contained the power circuit of a portable wireless telephone by the detecting signal from a comparison means and a portable wireless telephone is made to drive with the power of this charge cell, supply of the supply voltage stabilized in the portable wireless telephone is maintainable irrespective of the fall of the voltage of a mounted battery. For this reason, even if the supply voltage from the mounted battery by consumption of the large power at the time of an engine start and headlight lighting etc. falls momentarily, it is effective the ability to prevent that operation of a mounted portable wireless telephone becomes unstable, a malfunction arises or a talk state serves as **.

[0028] Here, if a switching circuit and a comparison means are prepared in a mounted adapter, a portable wireless telephone will use the conventional thing as it is, and it is a book. On the contrary, if a switching circuit and a comparison means are prepared in a portable wireless telephone, a mounted adapter will use the conventional thing as it is, and it is a book. Moreover, by connecting adverse current prevention diode between a switching circuit, the charging circuit of a mounted adapter, and the 2nd power circuit, when a switching circuit is turned on, it is prevented that fault arises in the charging circuit and the 2nd power circuit of a mounted adapter.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram of the 1st example of the current supply method of this invention.
[Drawing 2] It is the block diagram of the 2nd example of the current supply method of this invention.
[Drawing 3] It is the block diagram of the conventional current supply method.
[Description of Notations]
10 Portable Wireless Telephone
11 Charge Cell
12 1st Power Circuit
13 Power Supply Circuit Changing Switch
15 1st Voltage Detector
16 2nd Voltage Detector
18 Control Circuit
20 Mounted Adapter
21 Battery Electric Power Switch
22 2nd Power Circuit
23 Charging Circuit
24 25 Adverse current prevention diode
26 Switch
27 Voltage Comparator
28 Monostable Multivibrator
29 Reference Voltage
30 Automobile
B A mounted battery
IGN Ignition switch

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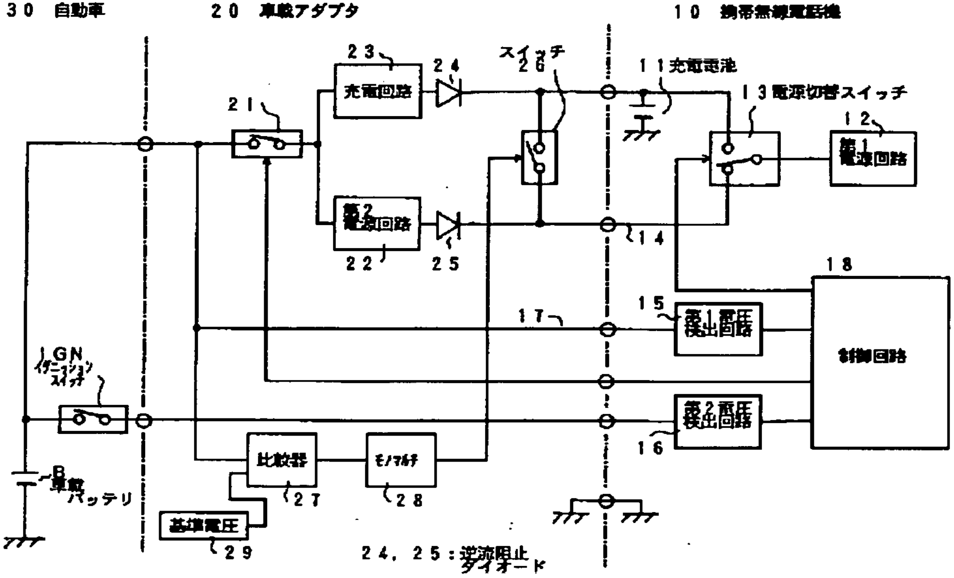
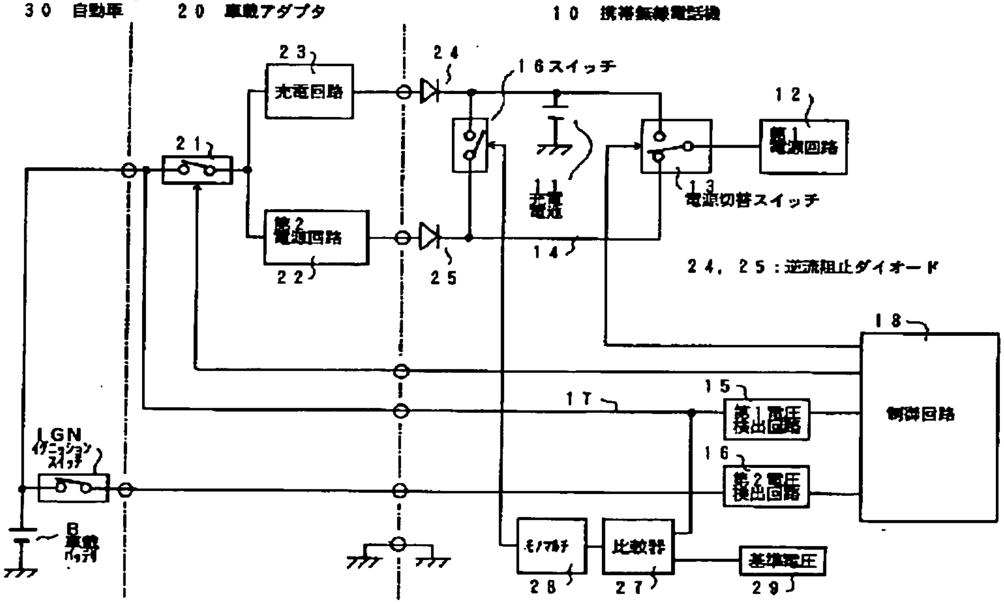
DRAWINGS

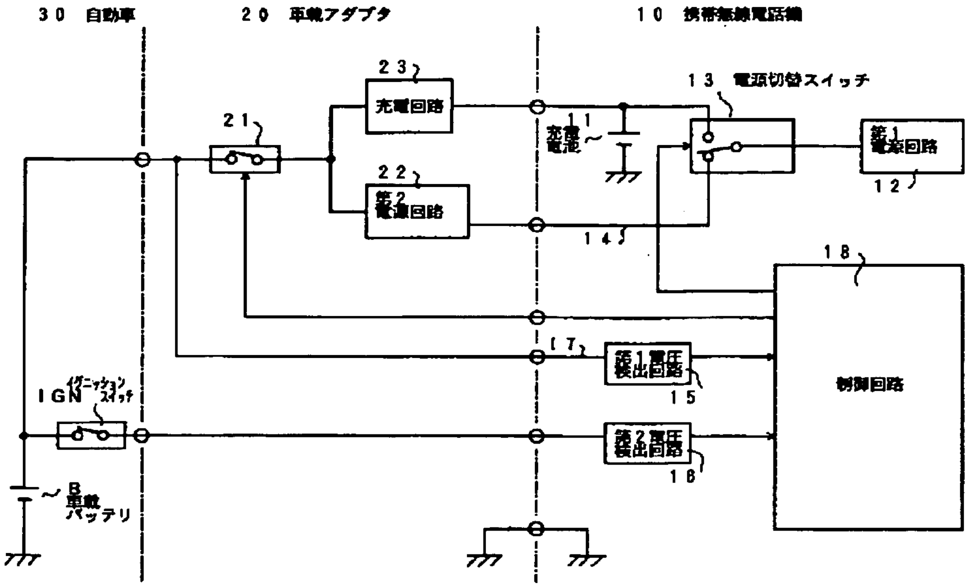
[Drawing 1]



[Drawing 2]



[Drawing 3]



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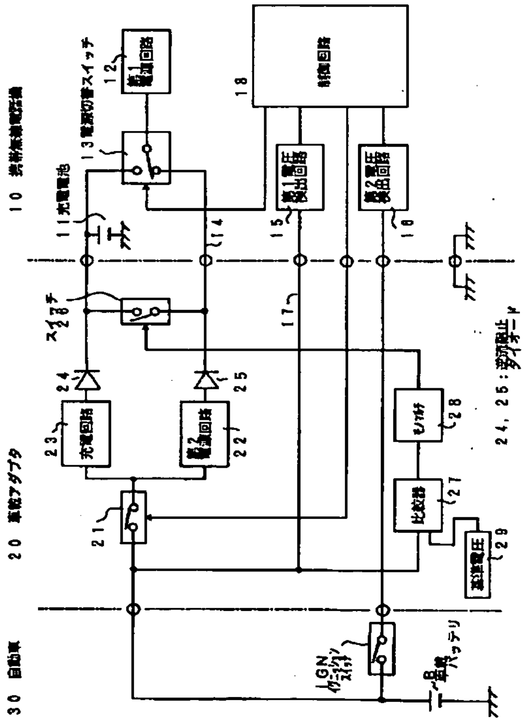
(54)【発明の名称】　車載型携帯無線電話機の電源供給方式

(57)【要約】

【目的】　携帯無線電話機を車載している際に、車載バッテリに短時間の電源電圧の低下が生じた場合でも無線電話機における誤動作と通話断を防止する。

【構成】　携帯無線電話機１０を車載アダプタ２０に接続しているときに車載バッテリＢの電圧が低下されると、基準電圧２９との比較手段２７からの検出信号によりスイッチ２６が直ちにオンし、携帯無線電話機１０の電源回路１２を充電電池１１に接続し、この充電電池１１の電力により携帯無線電話機を駆動させる。このため、車載バッテリＢの電圧の低下にかかわらず、携帯無線電話機の正常な動作が確保され、かつ通話断が回避される。



【特許請求の範囲】

【請求項１】　充電電池及び電源回路を内蔵し、車両に対して着脱可能に構成された携帯無線電話機と、この携帯無線電話機を車両に装着した際に、前記電源回路を充電電池から切り離して車両に装備されている車載バッテリに接続し、かつ前記充電電池を充電回路により充電する機能を有する車載アダプタとで構成される車載型携帯無線電話機の電源供給方式において、前記充電回路と前記電源回路を短絡するスイッチと、前記車載バッテリからの供給電圧を基準電圧と比較する比較手段とを備え、この比較手段によって車載バッテリからの供給電圧が基準電圧より低いことが検出された時、前記スイッチを一定時間の間オンし、前記充電回路に接続されている充電電池の電力を電源回路に供給するように構成したことを特徴とする車載型携帯無線電話機の電源供給方式。

【請求項２】　前記スイッチと比較手段とを車載アダプタに設けた請求項１の車載型携帯無線電話機の電源供給方式。

【請求項３】　前記スイッチと比較手段とを携帯無線電話機に設けた請求項１の車載型携帯無線電話機の電源供給方式。

【請求項４】　携帯無線電話機は、電源回路を充電電池と車載アダプタに設けたられた第２の電源回路とで切り替えるスイッチ手段を有し、前記スイッチはこのスイッチ手段を短絡し得るように接続してなる請求項２または３の車載型携帯無線電話機の電源供給方式。

【請求項５】　スイッチ回路と車載アダプタの充電回路と第２の電源回路との間には逆流阻止ダイオードを接続してなる請求項４の車載型携帯無線電話機の電源供給方式。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明はハンドヘルド・ポータブル自動車電話等の車載型携帯無線電話機の電源供給方式に関し、特に車載バッテリからの供給電圧が瞬間的に大きく変動低下したときに安定した電源電圧を供給することを可能にした電源供給方式に関する。

【０００２】

【従来の技術】ハンドヘルド・ポータブル自動車電話等の車載型でかつ着脱式の自動車電話装置は、車載アンテナ、携帯無線電話機、及び車載アダプタから構成され、携帯無線電話機にはアンテナ、無線機、充電電池等が備えられる。この携帯無線電話機は、通常では車載状態とされ、必要な電源は自動車のバッテリ（以下車載バッテリと称す）から供給される。また、車載アダプタから外して使用する場合は内蔵された充電電池が電源となり、この充電電池への充電は携帯無線電話機を車載アダプタと接続したときに車載バッテリの電源電圧により行われる。

【０００３】図３は従来のこの種の自動車電話装置における電源供給回路及び充電電池への充電回路の構成の一例を示すブロック図である。同図において、１０は携帯無線電話機、２０は車載アダプタの電源回路系、３０は自動車の電源系の一部であり、特に、Ｂは車載バッテリ、ＩＧＮはイグニッション・スイッチを示している。

【０００４】また、前記携帯無線電話機１０の電源制御系において、１１は携帯無線電話機内蔵の充電電池、１２は電源電圧を携帯電話機の各部に供給する第１電源回路、１３は充電電池１１また車載アダプタからの電源供給ライン１４のいずれか一方と第１電源回路１１との接続を切替える電源切替スイッチ、１５は電源ライン１７の電圧を検出して携帯無線電話機が車載アダプタ２０に接続されているか否かを判断する第１電圧検出回路、１６はイグニッションの電源ラインの電圧を検出してイグニッション・スイッチＩＧＮのオン、オフを判断する第２電圧検出回路、１８は第１及び第２の各電圧検出回路１５，１６からの信号により電源切替スイッチ１３及び車載アダプタ２０に設けたバッテリ電源スイッチ２１の制御を行う制御回路を示している。

【０００５】また、車載アダプタの電源回路系２０において、２１は車載バッテリＢから後述する充電回路２３及び第２電源回路２２への電源供給のオン／オフを切替えるバッテリ電源スイッチ、２２は車載バッテリからの電源電圧を携帯無線電話機の電源電圧として供給する第２電源回路、２３は車載バッテリの電力を充電電池１１へ供給する充電回路を示している。

【０００６】この電源供給方式においては、携帯無線電話機１０が車載アダプタ２０に接続されていると、第１電圧検出回路１５により携帯無線電話機１０が車載アダプタ２０に接続されたことが検出される。また、イグニッション・スイッチＩＧＮをオンにすると第２電圧検出回路１６によりイグニッション・スイッチがオンとなったことが検出される。これらの検出信号により制御回路１８はバッテリ電源スイッチ２１をオン、電源切替スイッチ１３を電源供給ライン１４側へ切替える。これにより車載バッテリＢの電力は第２電源回路２２から第１電源回路１２に供給され、更に携帯無線電話機１０へ供給され、また充電回路２３を通して充電電池１１へ供給され、これにより充電電池１１の充電が行われる。

【０００７】一方、携帯無線電話機１０が車載アダプタ２０に接続されていないときには、第１電圧検出回路１５によりその非接続の状態が検出されるため、制御回路１８はバッテリ電源スイッチ２１をオフし、かつ電源切替スイッチ１３を充電電池１１に切替え、充電電池１１の電力が第１電源回路１２に供給され、携帯無線電話機１０に供給される。なお、この種の電源供給方式に近い技術として、例えば特開平３－４０６３７号公報、特開昭５６－１３８３４３号公報に記載のものがある。

【０００８】

【発明が解決しようとする課題】このような従来の車載

携帯無線電話機の電源供給方式では、携帯無線電話機を車載アダプタに接続して車載バッテリから電力の供給を受けているときに、エンジンスタート時やヘッドライト点灯時等のように車載バッテリＢに大電力の負荷が生じると、これにより車載バッテリの起電圧が瞬間的に低下し、携帯無線電話機に供給される電源電圧が大きく変動低下し、携帯無線電話機の動作が不安定となり誤動作が生じる。また、著しい場合には通話状態が断となるおそれがある。

【０００９】一般に、携帯無線電話機では指定チャンネル、送信パワーレベル等通話状態を維持するための情報を常に保持しているため、瞬間的な電源電圧の低下により通話状態が維持できなくなった場合でも、保持している通話状態直前の情報に基づいて再び通話状態に復帰できるように構成されている。しかしながら、この場合には通話状態直前の情報に基づく復帰動作に所定の時間が必要とされるために、その間の誤動作を回避することは困難であり、かつ電源電圧の低下による短時間の通話断を避けることは難しいものとなっていた。

【００１０】

【発明の目的】本発明の目的は、短時間の電源電圧の低下が生じた場合でも無線電話機における誤動作を防止した車載型携帯無線電話機の電源供給方式を提供することにある。また、本発明の他の目的は、短時間の電源電圧の低下が生じた場合の通話断を未然に防止することを可能にした車載型携帯無線電話機の電源供給方式を提供することにある。

【００１１】

【課題を解決するための手段】本発明の電源供給方式は、充電電池及び電源回路を内蔵し、車両に対して着脱可能に構成された携帯無線電話機と、この携帯無線電話機を車両に装着した際に、前記電源回路を充電電池から切り離して車両に装備されている車載バッテリに接続し、かつ前記充電電池を充電回路により充電する機能を有する車載アダプタとで構成され、前記充電回路と前記電源回路を短絡するスイッチと、前記車載バッテリからの供給電圧を基準電圧と比較する比較手段とを備え、この比較手段によって車載バッテリからの供給電圧が基準電圧より低いことが検出された時、前記スイッチを一定時間の間オンし、前記充電回路に接続されている充電電池の電力を電源回路に供給するように構成したことを特徴とする。

【００１２】ここで、スイッチと比較手段とは車載アダプタに設け、或いは携帯無線電話機に設ける。また、スイッチと車載アダプタの充電回路と第２の電源回路との間には逆流阻止ダイオードを接続する。

【００１３】

【作用】携帯無線電話機を車載アダプタに接続しているときに車載バッテリの電圧が低下されると、比較手段からの検出信号によりスイッチが直ちにオンし、携帯無線電話機の電源回路を充電電池に接続し、この充電電池の電力により携帯無線電話機を駆動させる。このため、車載バッテリの電圧の低下にかかわらず、携帯無線電話機の正常な動作が確保され、かつ通話断が回避される。

【００１４】

【実施例】次に、本発明の実施例を図面を参照して説明する。図１は本発明の第１実施例のブロック図である。同図において、１０は携帯無線電話機、２０は車載アダプタ、３０は自動車の電源系の一部である。なお、自動車の電源系３０において、Ｂは車載バッテリ、ＩＧＮはイグニッション・スイッチである。

【００１５】前記携帯無線電話機１０の電源制御系において、１１は携帯無線電話機１０に内蔵の充電電池、１２は電源電圧を携帯無線電話機１０の各部に供給する第１電源回路、１３は充電電池１１または車載アダプタからの電源供給ライン１４のいずれか一方と前記第１電源回路１２との接続を切替える電源切替スイッチ、１５は電源ライン１７の電圧を検出して携帯無線電話機１０が車載アダプタ２０に接続されているか否かを判断する第１電源検出回路、１６はイグニッションの電源ラインの電圧を検出してイグニッション・スイッチＩＧＮがオンかオフかを判断する第２電圧検出回路、１８は前記第１及び第２電圧検出回路１５，１６からの信号により電源切替スイッチ１３及び前記車載アダプタ２０に設けたバッテリ電源スイッチ２１の制御を行う制御回路を示している。なお、この携帯無線電話機１０の電源制御系はこれまでのものと同じ構成とされている。

【００１６】また、車載アダプタの電源回路系２０において、２１は車載バッテリＢから後述する充電回路２３及び第２電源回路２２への電源供給のオン／オフを切替えるバッテリ電源スイッチ、２２は車載バッテリからの供給電圧を携帯無線電話機の電源電圧として供給する第２電源回路、２３は車載バッテリからの供給電圧を充電電池１１へ供給する充電回路、２４，２５は前記充電回路２３と第２電源回路２２の各出力側に接続した逆流阻止用ダイオード、２６はこれら逆流阻止用ダイオード２４，２５の出力間に接続して充電電池１１と車載アダプタからの電源供給ライン１４を短絡するスイッチ、２７は車載バッテリＢからの供給電圧と基準電圧２９を比較する電圧比較器、２８は電圧比較器２７の出力が変化した時に一定時間出力を保持する単安定マルチバイブレータ、２９は基準電圧を示す。

【００１７】次にこの実施例の動作について説明する。車載アダプタ２０に携帯無線電話機１０が接続され、イグニッション・スイッチＩＧＮがオンとなると、この状態は第１電圧検出回路１５と第２電圧検出回路１６により検出され、これら第１電圧検出回路１５及び第２電圧検出回路１６からの信号により制御回路１８は、バッテリ電源スイッチ２１をオンし、かつ電源切替スイッチ１３を電源供給ライン１４側へ切替える。したがって、車

載バッテリＢの電力が第２電源回路２２に供給され、逆流阻止ダイオード２５を通して第１電源回路１２に供給され、更に携帯無線電話機へ供給される。また、車載バッテリＢの電力は充電回路２３に供給され、逆流阻止ダイオード２４を通して充電電池１１へ供給され、これにより充電電池１１の充電が行われる。

【００１８】そして、この車載アダプタ２０を通して車載バッテリＢから電力の供給を受けている際に、エンジンスタートやヘッドライト点灯等の動作により車載バッテリＢからの供給電圧が一瞬の間基準電圧２９より低下すると、電圧比較器２７は基準電圧２９との電圧に比較に基づいて、直ちにこの状態を検出し、検出信号を単安定マルチバイブレータ２８へ送る。単安定マルチバイブレータ２８はこの検出信号を受けて一定時間の間スイッチ２６をオンさせる。これにより、充電電池１１がスイッチ２６、及び切替スイッチ１３を通して第１電源回路１２に接続されることになり、結果として携帯無線電話機に充電電池１１からの電力が供給されることになる。

【００１９】この単安定マルチバイブレータ２８による一定時間の動作が終了すると、このときには車載バッテリＢの電圧も復帰されているため、スイッチ２６はオフとなり、それまでの状態に復帰され、車載バッテリＢからの電力の供給を受けて携帯無線電話機１０が動作されることになる。なお、スイッチ２６がオンされることにより充電回路２３と第２電源回路２２は第１電源回路１２に短絡された状態とされるが、それぞれには逆流阻止ダイオード２４，２５が接続されているため、回路上の不具合が生じることはない。

【００２０】したがって、エンジンスタート時やヘッドライト点灯時等の大電力の消費によって、車載バッテリＢからの供給電圧が瞬間的に低下しても、電圧比較器２７と単安定マルチバイブレータ２８の動作によってスイッチ２６が瞬時にオンされ、携帯無線電話機１０に内蔵された充電電池１１の電源電圧が携帯無線電話機１０に供給されるので、携帯無線電話機１０の供給電圧が低下することはなく、誤動作及び通話断を防止することがきる。

【００２１】なお、携帯無線電話機１０が車載アダプタ２０に接続されていないときには、第１電圧検出回路１５によりその非接続の状態が検出されるため、制御回路１８はバッテリ電源スイッチ２１をオフし、かつ電源切替スイッチ１３を充電電池１１に切替え、充電電池１１の電力が第１電源回路１２に供給され、携帯無線電話機に供給される。これにより、携帯無線電話機は充電電池１１により電力が供給されることになる。

【００２２】図２は本発明の第２実施例のブロック図である。この実施例において、第１実施例と等価な部分には同一符号を付してある。即ち、１０は携帯無線電話機、２０は車載アダプタ、３０は自動車の電源系の一部である。また、Ｂは車載バッテリ、ＩＧＮはイグニッション・スイッチである。

【００２３】この実施例では、携帯無線電話機の電源制御系１０に、充電電池１１、第１電源回路１２、電源切替スイッチ１３、第１電源検出回路１５、第２電圧検出回路１６、制御回路１８を備えるとともに、前記実施例では車載アダプタ２０に設けたていた逆流阻止ダイオード２４，２５、スイッチ２６、電圧比較器２７、単安定マルチバイブレータ２８、基準電源２９を備えている。また、車載アダプタ２０の電源回路系に、バッテリ電源スイッチ２１、第２電源回路２２、充電回路２３を備えている。

【００２４】この第２実施例においても、車載アダプタ２０と携帯無線電話機１０が接続され、イグニッション・スイッチＩＧＮがオンとなると、車載バッテリＢの電力が第２電源回路２２に供給され、逆流阻止ダイオード２５を通して第１電源回路１２に供給され、更に携帯無線電話機１０へ供給される。また、車載バッテリＢの電力は充電回路２３に供給され、逆流阻止ダイオード２４を通して充電電池１１へ供給され、これにより充電電池１１の充電が行われることは同じである。

【００２５】そして、この際に、エンジンスタートやヘッドライト点灯等の動作により車載バッテリＢからの供給電圧が一瞬の間基準電圧２９より低下すると、電圧比較器２７は基準電圧２９との電圧に比較に基づいて、直ちにこの状態を検出して単安定マルチバイブレータ２８を動作させ、一定時間の間スイッチ２６をオンさせる。これにより、充電電池１１がスイッチ２６、及び電源切替スイッチ１３を通して第１電源回路１２に接続されることになり、結果として携帯無線電話機１０に充電電池１１からの電力が供給されることになることは同じである。

【００２６】したがって、エンジンスタート時やヘッドライト点灯時等の大電力の消費によって、車載バッテリＢからの供給電圧が瞬間的に低下しても、電圧比較器２７と単安定マルチバイブレータ２８の動作によってスイッチ２６が瞬時にオンされ、携帯無線電話機１０に内蔵された充電電池１１の電源電圧が携帯無線電話機に供給されるので、携帯無線電話機１０の供給電圧が低下することはなく、誤動作及び通話断を防止することがきる。

【００２７】

【発明の効果】以上説明したように本発明は、携帯無線電話機を車載アダプタに接続しているときに車載バッテリの電圧が低下されると、比較手段からの検出信号によりスイッチ回路が直ちにオンし、携帯無線電話機の電源回路を内蔵した充電電池に接続し、この充電電池の電力により携帯無線電話機を駆動させるため、車載バッテリの電圧の低下にかかわらず、携帯無線電話機に安定した電源電圧の供給を維持することができる。このため、エンジンスタート時やヘッドライト点灯時等の大電力の消費による車載バッテリからの供給電圧が瞬間的に低下し

ても、車載携帯無線電話機の動作が不安定になって誤動作が生じたり、通話状態が断となったりすることを防止することができる効果がある。

【００２８】ここで、スイッチ回路と比較手段とを車載アダプタに設ければ、携帯無線電話機は従来のものをそのまま利用して本発明の効果を得ることができる。逆に、スイッチ回路と比較手段とを携帯無線電話機に設ければ、車載アダプタは従来のものをそのまま利用して本発明の効果を得ることができる。また、スイッチ回路と車載アダプタの充電回路と第２の電源回路との間には逆流阻止ダイオードを接続することで、スイッチ回路がオンされたときに車載アダプタの充電回路や第２の電源回路に不具合が生じることが防止される。

【図面の簡単な説明】

【図１】本発明の電源供給方式の第１実施例のブロック図である。

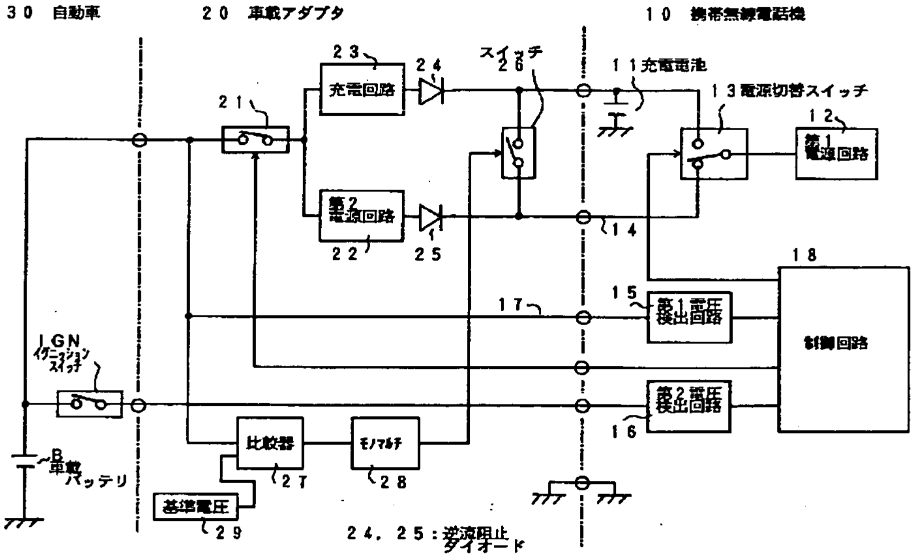
【図２】本発明の電源供給方式の第２実施例のブロック図である。

【図３】従来の電源供給方式のブロック図である。

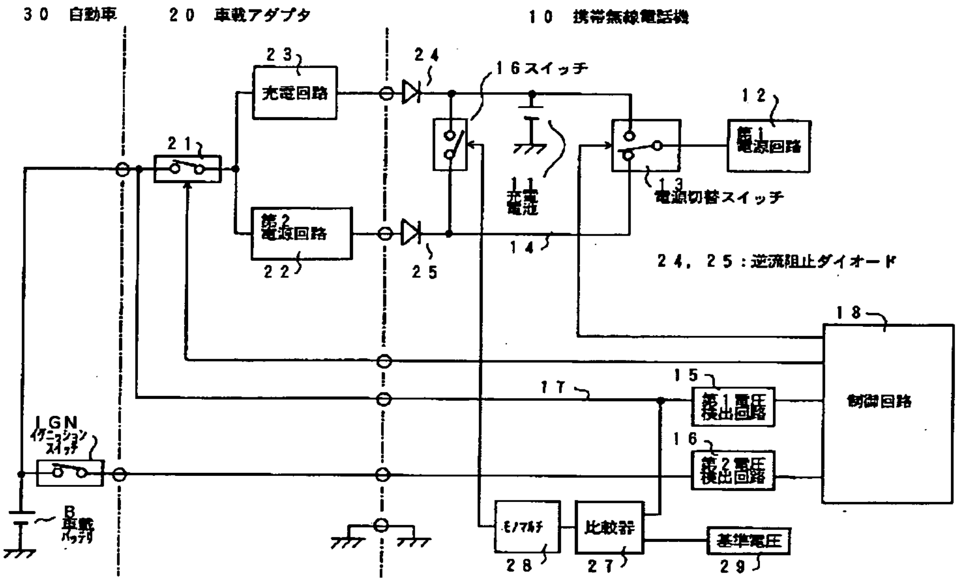
【符号の説明】

１０	携帯無線電話機
１１	充電電池
１２	第１電源回路
１３	電源切替スイッチ
１５	第１電圧検出回路
１６	第２電圧検出回路
１８	制御回路
２０	車載アダプタ
２１	バッテリ電源スイッチ
２２	第２電源回路
２３	充電回路
２４，２５	逆流阻止ダイオード
２６	スイッチ
２７	電圧比較器
２８	単安定マルチバイブレータ
２９	基準電圧
３０	自動車
B	車載バッテリ
IGN	イグニッション・スイッチ

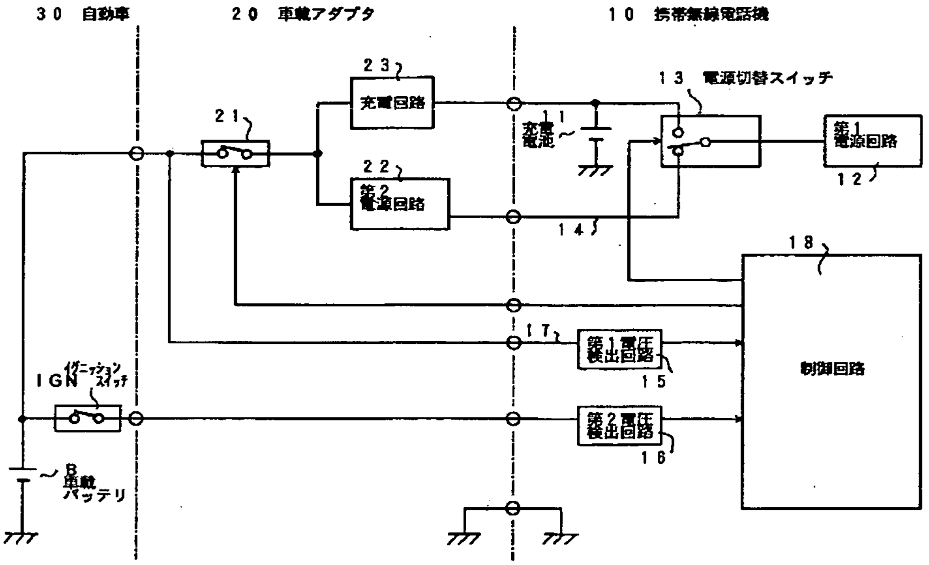
【図１】



【図2】


30　自動車
20　車載アダプタ
10　携帯無線電話機
23
充電回路
24
16スイッチ
12
第1電源回路
21
11
充電電池
13
電源切替スイッチ
第2電源回路
22
25
14
24，25：逆流阻止ダイオード
18
制御回路
17
15
第1電圧検出回路
16
第2電圧検出回路
IGN
イグニッションスイッチ
B
車載バッテリ
モノマルチ
比較器
基準電圧
28
27
29

【図3】


30　自動車
20　車載アダプタ
10　携帯無線電話機
23
充電回路
13　電源切替スイッチ
21
11
充電電池
第1電源回路
12
22
第2電源回路
14
18
制御回路
17
第1電圧検出回路
15
IGN
イグニッションスイッチ
第2電圧検出回路
16
B
車載バッテリ